

Claims

- [c1] 1.A conductivity sensor comprising:
a first annular electrode having a first inner diameter;
a second annular electrode having the first inner diameter; and
a tubular portion disposed axially between said first electrode and said second electrode, said tubular portion having a second inner diameter greater than said first inner diameter,
said tubular portion, said first electrode and said second electrode defining a sensor cell, said cell having a cell length between said first electrode and said second electrode.
- [c2] 2.A conductivity sensor as recited in claim 1 wherein said cell has a cell constant defined by the formula:
$$\pi D_2^2 / 4L$$

where D_2 is said second inner diameter.
- [c3] 3.A conductivity sensor as recited in claim 1 further comprising a seal material between said first annular electrode and said tubular portion.
- [c4] 4.A conductivity sensor as recited in claim 1 further comprising a control circuit generating an output corresponding to a conductivity of a fluid between said first annular electrode and said second annular electrode.
- [c5] 5.A conductivity sensor as recited in claim 1 further comprising a calibration circuit.
- [c6] 6.A conductivity sensor as recited in claim 5 wherein said calibration circuit comprises a zero adjustment circuit.
- [c7] 7.A conductivity sensor as recited in claim 5 wherein said calibration circuit comprises a gain adjustment circuit.
- [c8] 8.A conductivity sensor as recited in claim 1 wherein said gain adjustment circuit is coupled to said first electrode.
- [c9] 9.A conductivity sensor as recited in claim 1 further comprising a buffer circuit coupled to said first electrode.

- [c10] 10.A conductivity sensor as recited in claim 1 wherein said control circuit is operational amplifier-based.
- [c11] 11.A conductivity sensor comprising:
a first annular electrode having a first inner diameter and a first outer diameter, said first annular electrode having a first threaded portion said first outer diameter;
a second annular having a second first inner diameter and the second outer diameter, said second annular electrode having a second threaded portion said second outer diameter; and
a tubular portion disposed axially between said first electrode and said second electrode, said tubular portion having a third inner diameter greater than said first inner diameter and said second inner diameter, said tubular portion, said first electrode and said second electrode defining a sensor cell, said cell having a cell length between said first electrode and said second electrode.
- [c12] 12.A sensor as recited in claim 11 wherein said first inner diameter and said second inner diameter are equivalent.
- [c13] 13.A sensor as recited in claim 11 wherein said first outer diameter and said second outer diameter are equivalent.
- [c14] 14.A conductivity sensor as recited in claim 11 further comprising a seal material between said first annular electrode and said tubular portion.
- [c15] 15.A conductivity sensor as recited in claim 11 wherein said seal material comprises polytetrafluoroethylene.
- [c16] 16.A method of assembling a conductivity sensor comprising:
coupling a first annular electrode having a first inner diameter to a tubular portion;
coupling a second annular electrode having the first inner diameter to the tubular portion so that the tubular portion is positioned axially between said first electrode and said second electrode.

- [c17] 17.A method as recited in claim 16 wherein said step of coupling a first annular electrode having a first inner diameter to a tubular portion comprises threadably coupling a first annular electrode having a first inner diameter to a tubular portion.
- [c18] 18.A method as recited in claim 16 further comprising coupling a control circuit to said first annular electrode and said second annular electrode calibrating the control circuit.
- [c19] 19.A method as recited in claim 18 wherein calibrating said control circuit comprises open circuit zeroing said control circuit.
- [c20] 20.A method as recited in claim 18 wherein calibrating said control circuit comprises adjusting the gain of a buffer circuit.

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